

What is claimed is:

1. A method for controlling packet flow, comprising:

determining priority data of a packet received by one of a plurality of ports;

5 determining whether an address pointer of the packet memory exceeds a predetermined limit value by monitoring a packet memory;

selecting a port to control packet flow by using the priority data when the address pointer of the packet memory exceeds the predetermined limit value; and directing the selected port to control the packet flow.

10

2. The method of claim 1, wherein the priority data are determined by:

determining whether the priority data are designated to the port or the packet;

determining whether the packet is a VLAN packet or an IP packet when the priority data are designated to the packet; and

15 determining the priority by reading priority field data of the VLAN packet or the IP packet.

3. The method of claim 2, wherein the priority is determined as a high priority when the priority of the VLAN packet or the IP packet is over a predetermined critical value  
20 and the priority is determined as a low priority when the priority of the VLAN packet or the IP packet is under the predetermined critical value.

4. The method of claim 3, wherein the port is selected by:

selecting all ports having the low priority from the plurality of ports when the address pointer exceeds a first limit value; and

5 selecting all ports when the address pointer exceeds a second limit value that is higher than the first limit value.

5. The method of claim 3, wherein the port is selected by:

10 selecting a subset of ports having the low priority when the address pointer exceeds a first limit value;

selecting all ports having the low priority and a subset of ports having the high priority when the address pointer exceeds a second limit value that is higher than the first limit value; and

15 selecting all ports when the address pointer exceeds a third limit value that is higher than the second limit value.

6. The method of claim 5, wherein a round-robin method is used for selecting the subset of ports having the high priority or the low priority.

20 7. A method for controlling packet flow, comprising:

determining priority data of a packet received by one of a plurality of ports;

measuring bandwidth data of each port;  
outputting state data of each port by using the priority data and the bandwidth data;  
determining whether an address pointer of the packet memory exceeds a  
predetermined limit value by monitoring a packet memory;  
5 selecting a port to control packet flow by using the state data when the address  
pointer of the packet memory exceeds the predetermined limit value; and  
directing the selected port to control the packet flow.

8. The method of claim 7, wherein the bandwidth data are measured by:

10 counting the number of packets received by the port;  
calculating an average bandwidth by dividing the number of packets by a  
predetermined time period; and  
outputting a first signal when the average bandwidth exceeds a predetermined  
critical value and a second signal when the average bandwidth does not exceed the  
15 predetermined critical value.

9. The method of claim 7, wherein the priority data are determined by:

determining whether the priority data are designated to the port or the packet;  
determining whether the packet is a VLAN packet or an IP packet when the priority  
20 data is designated to the packet; and  
determining the priority by reading a priority field data of the VLAN packet or the IP

packet.

10. The method of claim 9, wherein the priority data are determined by:

outputting a first signal when the priority is designated to the port and a second

5 signal when the priority is not designated to the port; and

outputting a first signal when the priority of the VLAN packet or the IP packet is over the predetermined critical value and a second signal when the priority of the VLAN packet or the IP packet is under the predetermined critical value in case the priority is designated to the VLAN packet or the IP packet.

10

11. The method of claim 7, wherein when outputting state data, an OR operation of a signal resulting from the priority determination and a signal related to the bandwidth are output.

15

12. The method of claim 7, wherein when outputting state data, an AND operation of a signal resulting from the priority determination and a signal related to the bandwidth are output.

13. The method of claim 7, wherein the port is selected by:

20

selecting all ports of which state output data are first state among the plurality of ports when the address pointer exceeds a first limit value; and

selecting all ports when the address pointer exceeds a second limit value that is higher than the first limit value.

14. The method of claim 11, wherein the port is selected by:

5 selecting a subset of ports of which state output data are first state when the address pointer exceeds a first limit value;

selecting all ports of which state output data are first state and a subset of ports of which state output data are second state when the address pointer exceeds a second limit value that is higher than the first limit value; and

10 selecting all ports when the address pointer exceeds a third limit value that is higher than the second limit value.

15. A packet flow control device comprising:

a plurality of port control units being respectively coupled to a plurality of ports for  
15 determining priority data of a packet received by a port; and

a queue manager for monitoring a state of a packet memory, and for selecting a port to direct flow control by using the priority data determined by the port control units when an address pointer of the packet memory exceeds a predetermined limit value.

20 16. The packet flow control device of claim 15, wherein each of the plurality of port control units comprises:

a bandwidth control section for measuring bandwidth data of a port;

a priority outputting section for determining the priority data of a packet received by a port; and

a flow control directing section for requesting a port to produce a flow control packet  
5 in response to a flow control signal for directing the flow control from said queue manager.

17. The packet flow control device of claim 16, wherein the bandwidth control section comprises:

10 a counter for counting the number of packets received by a port;

a bandwidth calculating section for calculating an average bandwidth by dividing the counted number by a predetermined time period; and

a comparing section for determining whether the average bandwidth exceeds a predetermined critical value.

15

18. The packet flow control device of claim 16, wherein the priority outputting section comprises:

a priority data extracting section for determining whether the priority data are designated to the port or to the packet, for determining whether the packet is a VLAN  
20 packet or an IP packet when the priority data is designated to the packet, and for determining the priority by reading a priority field data of the VLAN packet or the IP packet;

a port priority outputting section for outputting a port priority data when the priority is designated to the port;

a VLAN priority outputting section for determining the priority of the VLAN packet by using the read priority data when the priority is designated to VLAN packet; and

5 a IP priority outputting section for determining the priority of the IP packet by using the read priority data when the priority is designated to the IP packet.

19. The packet flow control device of claim 16, wherein the queue manager comprises:

10 a limit value detecting section for detecting whether the address pointer exceeds the limit value;

a flow control determining section for directing the port in a predetermined state to control the packet flow when the address pointer exceeds the limit value;

15 a port state determining section for determining the state of the port by receiving output signal of the bandwidth control section and the priority outputting section; and

a flow control signal transmitting section for selecting the port in the predetermined state according to the data output by the port state determining section and transmitting a flow control signal to the port control unit of the selected port in response to a flow control direction of the flow control directing section.

20

20. The packet flow control device of claim 19, wherein the flow control signal transmitting section selects all ports having the low priority among the plurality of ports

when the address pointer exceeds a first limit value, and selects all ports when the address pointer exceeds a second limit value that is higher than the first limit value.

21. The packet flow control device of claim 19, wherein the flow control signal  
5 transmitting section selects a subset of ports having the low priority when the address pointer exceeds a first limit value, selects all ports having the low priority and a subset of ports having the high priority when the address pointer exceeds a second limit value that is higher than the first limit value, and selects all ports when the address pointer exceeds a third limit value that is higher than the second limit value.

10

22. The packet flow control device of claim 19, wherein the bandwidth control section and the priority outputting section output a signal of high state or low state according to the bandwidth and the priority, wherein the port state determining section determines the state of the port by performing OR operation of the output signals of the  
15 bandwidth control section and the priority outputting section.

23. The packet flow control device of claim 19, wherein the bandwidth control section and the priority outputting section output a signal of high state or low state according to the bandwidth and the priority, wherein the port state determining section  
20 determines the state of the port by performing AND operation of the output signals of the bandwidth control section and the priority outputting section.



24. The packet flow control device of claim 22, wherein the flow control signal transmitting section selects all ports of which state data are a first signal from among the plurality of ports when the address pointer exceeds a first limit value, and selects all ports when the address pointer exceeds a second limit value that is higher than the first  
5 limit value.

25. The packet flow control device of claim 22, wherein the flow control signal transmitting section selects a subset of ports of which state data are first signal when the address pointer exceeds a first limit value, selects all ports of which state data are a  
10 first signal and a subset of ports of which state data are a second signal when the address pointer exceeds a second limit value that is higher than the first limit value, and selects all ports when the address pointer exceeds a third limit value that is higher than the second limit value.